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### NANOBALCIS A NEW EULIMID GENUS (PROSOBRANCHIA) PARASITIC ON CIDAROID SEA URCHINS, WITH TWO NEW SPECIES, AND COMMENTS ON *SABINELLA BONIFACIAE* (NORDSIECK)\*\*\*

#### Summary

*Nanobalcis* n. gen. is erected for a group of small unmodified eulimids parasitic on cidaroid sea urchins with *Eulima nana* MONTEROSATO, 1878 as type species. *N. nana* is here for the first time reported from its host, *Cidaris cidaris*. *N. worsfoldi* sp.n. is described from the Caribbean pencil urchin *Eucidaris tribuloides*, and *N. cberbonnieri* sp.n. is a parasite on *Prionocidaris baculosa annulifera* in New Caledonia...

*Sabinella bonifaciae* (NORDSIECK) is reported from its host, *Cidaris cidaris*, where it causes basal swelling on the primary spines, by being more or less permanently attached in small groups.

#### Riassunto

*Nanobalcis* n. gen. è stato istituito per un gruppo di esigue Eulimidi non modificate, parassite su ricci di mare dell'ordine Cidaroida. La specie tipo è *Eulima nana* MONTEROSATO, 1878. Per la prima volta *N. nana* viene qui segnalata con i suo ospite, *Cidaris cidaris*. Vengono inoltre descritte *N. worsfoldi* sp.n. trovata sul riccio a matita dei Caraibi *Eucidaris tribuloides* e *N. cbarbonnieri* sp. n., parassita su *Prionocidaris baculosa annulifera* della Nuova Caledonia.

*Sabinella bonifaciae* (NORDSIECK), trovata sul suo ospite *Cidaris cidaris*, vive in piccoli gruppi più o meno permanentemente aderente alle spine primarie, provocando un notevole ingrossamento alla base delle stesse.

#### Introduction

The family Eulimidae comprises numerous species almost exclusively parasitic on echinoderms. The family contains all stages of adaptations to parasitism, from species with a normal mesogastropod anatomy, to species which can be recognized as gastropods only from their larval stages. The species and genera show a high degree of host specificity and related genera or species live on related host taxa (WARÉN 1984).

One of us (MIFSUD) recently obtained a dozen specimens of the cidaroid sea urchin *Cidaris cidaris* (L., 1757), which had been taken in fishing nets. The sea urchins were brought up to the surface, quite undisturbed compared with normal dredging, and carefully freed from the net. Close examination of the sea urchins revealed numerous, mainly very young, eulimid snails attached to the test and the spines, of almost all specimens. Only two *Cidaris cidaris* had no parasitic snail attached (both from Ras-il-Qaws, western Malta, 80-100 m).

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The specimens were identified to belong to *Eulima nana* MONTEROSATO and *Sabinella bonifaciae* NORDSIECK, and both species often occurred on the same host specimen. None of these species were previously known from their host, although BOUCHET & WARÈN (1986) suspected *Sabinella bonifaciae* to parasitize *Cidaris cidaris*.

WARÈN has three times during the last few years received information about and specimens of an undescribed eulimid from the Caribbean, from R. MOOLENBEEK (WARÈN & MOOLENBEEK, 1989), J. WORSFOLD and C. REDFERN, which had been found parasitizing *Eucidaris tribuloides* (LAMARCK). He had also got a specimen of an undescribed, very similar eulimid from a cidaroid sea urchin from New Caledonia. The present material and material presented by WARÈN et al. (1984) warrant the erection of a new genus for the species concerned.

We also take this occasion to present some new information about the biology of *Sabinella bonifaciae*.

This article forms a supplement to the preliminary report by MIFSUD (1990).

## Family EULIMIDAE

Genus *Sabinella* MONTEROSATO, 1890

***Sabinella bonifaciae*** NORDSIECK, 1974

(Figs 1-2, 4C)

For details about nomenclatorial history, type material etc., see BOUCHET & WARÈN 1986 and WARÈN (in press).

*New material.* 30 specimens from Puolo, near Sorrento, Italy, taken from refuse from fishing nets with many *Cidaris cidaris*, leg. P. CROVATO, Swedish Museum of Natural History. - 3; 2; and 1 specimens on 3 parasitized hosts (6 hosts examined), *Cidaris cidaris*, off Ras-il-Wahx, western Malta, 80-100 m, rocky bottom, leg. C. MIFSUD October 1989. - 2 early post-larvae (together with 16 *N. nana*), on a single *Cidaris cidaris*, Qammieh, northwestern Malta, 80-100 m, leg C. MIFSUD 30 December 1989.

*Remarks.* Three specimens were attached in a group at the basal part of a lateral primary spine. The spine had doubled its diameter where the snails were attached and despite that the proboscides had been retracted when the snails were examined there remained the mucus collars indicating where the snails had been attached. Five such collars were found (Fig. 2) indicating that probably two additional specimens had been present. The three specimens, which were dried when first examined by WARÈN, were rehydrated, and proved to still have the proboscis partly everted. It is thus not known whether this species can retract the proboscis or not, when adult, although young specimens can do so judging from photos of crawling specimens (MIFSUD, 1990).

*Sabinella bonifaciae* evidently sits permanently attached, at least when it has reached a size of one or two mm, with the collar (Fig. 2B) covering the basal part of the proboscis. A similar collar has been reported by WARÈN (1984) and WARÈN & MOOLENBEEK (1989) from a related species, *Sabinella troglodytes* (THIELE, 1925). It is, however, not known how the eulimids get the nourishment.

Small specimens of *S. bonifaciae*, less than 1 mm high were found everywhere on the tests.

BOUCHET & WARÈN (1986) tentatively identified two specimens found on the peristome of *Stylocidaris affinis* from the Bay of Biscay and west of Gibraltar, as *S. bonifaciae*. These doubts are now even stronger because of the different ways of parasitism, but since no additional material from *Stylocidaris* has been obtained, the question remains unsolved.

### ***Nanobalcis* gen. nov. WARÈN & MIFSUD**

TYPE SPECIES. *Eulima nana* MONTEROSATO, 1875

*Diagnosis.* Small eulimids with an almost straight, unusually broad, colourless shell of about four to seven slightly convex teleoconch whorls. Incremental scars distinct. Aperture low, evenly rounded. Outer lip distinctly retracted at the suture. Parasitic on cidaroid sea urchins. Animal with long, slender tentacles, long motile anterior part of the foot, fully retractile proboscis and large black eyes of a diameter 1/3 of the distance between them.

*Remarks.* WARÈN et al. (1984) described two additional species, which shall be referred to *Nanobalcis*, *Vitreolina hawaiiensis* and *V. chondrocidaricola*, parasitic on *Prionocidaris hawaiiensis* and *Chondrocidaris gigantea* from Hawaii, and WARÈN & MOOLENBEEK (1989) mentioned, but did not describe «Eulimid n. sp.» parasitic on *Eucidaris tribuloides* from north of Venezuela. The two former species both differ from *N. nana* by having more convex whorls. The latter species is very similar to *N. nana* and is here described as *N. worsfoldi*.

A fourth, similar but somewhat larger species, is described from *Prionocidaris baculosa annulifera*, from New Caledonia, as *N. cherbonnieri*.

The species of *Nanobalcis* bear some resemblance to members of the genus *Parvioris*, where WARÈN (1981) earlier classified *N. nana*, but species of that genus have a much straighter outer lip, less convex whorls and usually a less solid shell, with an operculum which can not be retracted into the aperture. Furthermore, as far as known, the species of *Parvioris* are parasitic on star-fishes.

***Nanobalcis nana*** (MONTEROSATO, 1875)

*Eulima nana* MONTEROSATO 1875: 35 (nomen nudum)

*Eulima nana* MONTEROSATO 1878: 95 (nomen nudum)

*Eulima nana* MONTEROSATO 1878: 153

*Type locality.* Palermo, Sicily (50-90 m)

*Type material.* There is no material present in the Zoological Museum of Rome (or any other museum) with indication that it dates from the time when *Eulima nana* was described.

*New material.* 60 specimens from Puolo, near Sorrento, Italy, taken from refuse from fishing nets with many *Cidaris cidaris*, leg. P. CROVATO, Swedish Museum of Natural History. - 11 specimens on 6 *Cidaris cidaris*, off Ras-il-Wahx, western Malta, 80-100 m, rocky bottom., leg. C. MIFSUD October 1989. - 16 young specimens (together with 2 *S. bonifaciae*), on a single *Cidaris cidaris* (3 examined), Ras-il-Qammieh, northwestern Malta, 80-100 m, leg C. MIFSUD 30 December 1989.

*Remarks.* WARÈN has examined numerous specimens of this species in the Zoological Museum of Rome and in British Museum of Natural History determined by MONTEROSATO, and there seems to be no problems with the identity of it. We have therefore found it unnecessary to select a neotype.

***Nanobalcis worsfoldi*** sp.n., WARÈN

(Figs 3A-D, 4B)

*Type locality.* On *Eucidaris tribuloides* (LAMARCK), 8 km north of Eight Mile Rock, Grand Bahama, Leg. J. Worsfold May 1983.

*Type material.* Holotype, ANSP 375972 and three paratypes, ANSP 375973 in the Academy of Natural Sciences, Philadelphia; two paratypes in U.S. National Museum of Natural History, Washington, D.C., USNM 260520; 10 paratypes in Swedish Museum of Natural History no. 4152.

*Material examined.* Academy of Natural Science, Philadelphia 300646, 1 shell, British West Indies, Grand Cayman Island, 1 mile west of Georgetown, 30-35 m. - Coll. W. LYONS, 1 specimen, stn E66-318, 26° 24'N, 83° 22'W, Hourglass station L, off Fort Meyers, Florida 1966, dredged 55 m. - E-66-373, Hourglass station M, 26° 24'N, 83° 43'W, dredged 73 m, 1 shell. - Shells rare in beach drift and sediment, down to 60 m, also on *Eucidaris tribuloides* from *Thalassia*-beds and under rocks at Chub Rocks, 6 m, Great Abaco, Bahamas, C. REDFERN, personal communication. - Venezuela, Aruba, Malmok, on *Eucidaris tribuloides*, leg. I. PEETERS, 1986, 16 specimens, Zoological Museum, Amsterdam (See WARÈN & MOOLENBEEK 1989 and PEETERS, 1990).

*Description.* Shell small, solid, transparent, fairly straight, slightly irregularly coiled with a small aperture. The larval shell (Fig. 4B) is colourless, perfectly smooth, and has about 3.5 distinctly convex whorls. Its height is 0.43 mm. The teleoconch has five, slightly convex and perfectly smooth, colourless whorls, with approximately one incremental scar per whorl. The suture is rather deep and distinct with a narrow but conspicuous subsutural zone (not visible in SEM photos). The aperture is low and

with an unusually straight outer lip (front view) which seen from the side is distinctly retracted at the suture and has its most protruding part situated at the lower 2/5.

*Male.* About 2/3 of the size of the female and proportionally broader 46% of height; 43% in female.

*Remarks.* This new species lives on a cidaroid sea urchin but nothing is known about the precise way of feeding. It is very similar to *N. nana*, but is smaller, and the male has a proportionally lower aperture 35% of height of shell (40% in *N. nana*).

***Nanobalcis cherbonnieri* sp. n., WARÈN**  
(Fig. 4D-F)

*Type material.* Holotype in Museum National d'Histoire Naturelle, Paris.

*Type locality.* New Caledonia, off Recif Tambo, 100 m, 06 June 1979, on a spine of *Prionocidaris baculosa annulifera* (Lamarck).

*Material examined.* The holotype.

*Distribution.* Only known from the type locality.

*Description.* Shell vitreous, small, pointed, slender, slightly irregularly coiled, with an inflated body-whorl and small aperture. The larval shell consists of almost 4.0 colourless, distinctly convex whorls, separated from the teleoconch by a rather weak incremental scar. Its height is 0.51 mm. The holotype has 6.5 distinctly convex, colourless, perfectly smooth teleoconch whorls without a trace of micro sculpture. It has 5 incremental scars, at 1.5, 2.5, 3.5, 4.5 and 5.5. whorls, counted from the outer lip. The aperture is comparatively small and almost concealed by the inflated bodywhorl. The outer lip is almost orthocone, retracted at the suture, distinctly projecting at the midpoint of its height.

*Dimensions.* Height of the holotype 4.12 mm.

*Remarks.* The holotype was found by Dr. G. CHERBONNIER, attached to a primary spine of the host, by means of a «thin thread». This is probably a mucus thread formed by the posterior pedal gland of the snail which is used by most eulimids to stay on the host when the proboscis is retracted.

Since it is the only specimen known, the sex is unknown.

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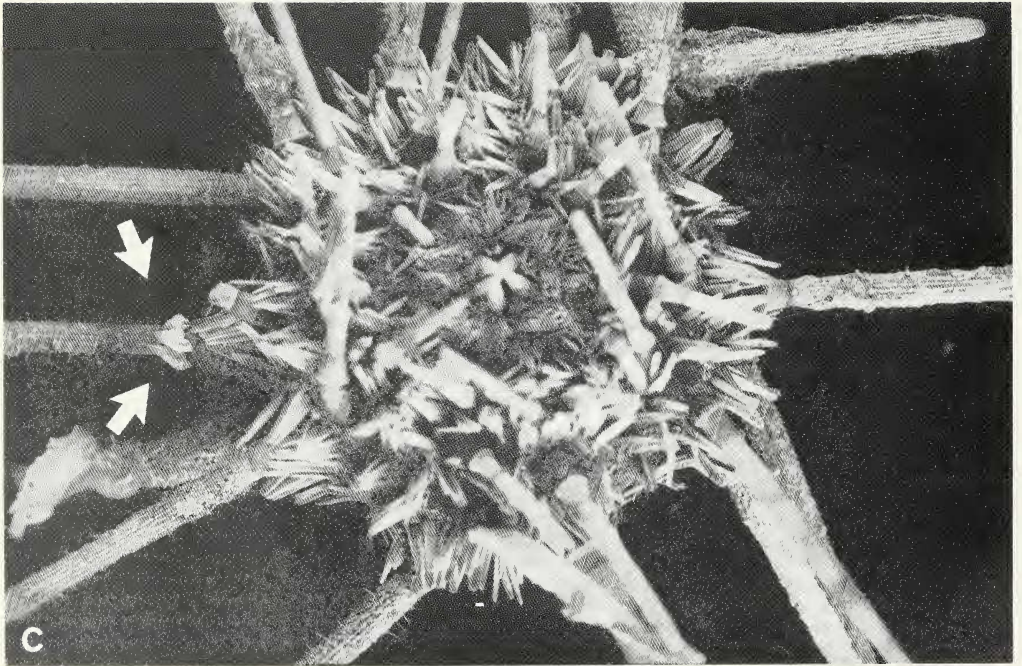
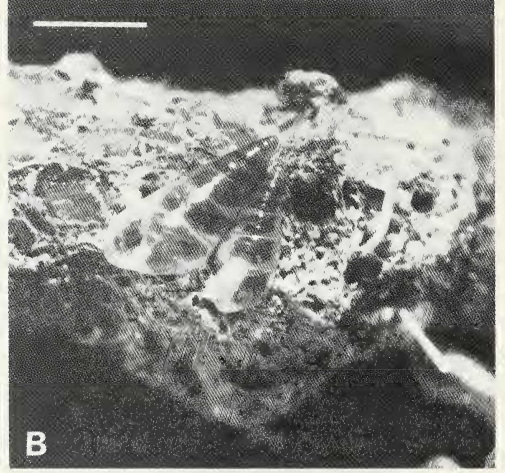
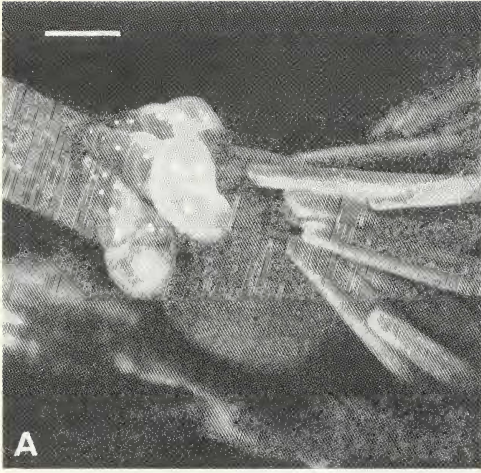


Fig. 1 *Cidaris cidaris* parasitized by *Sabinella bonifaciae* and *Nanobalcis nana*. A. *S. bonifaciae* in situ on spine (cf. Fig. 2) B. *N. nana* in situ on spine. C. Host with *S. bonifaciae* indicated by arrows, diameter of test 23 mm. Scale lines 1 mm.

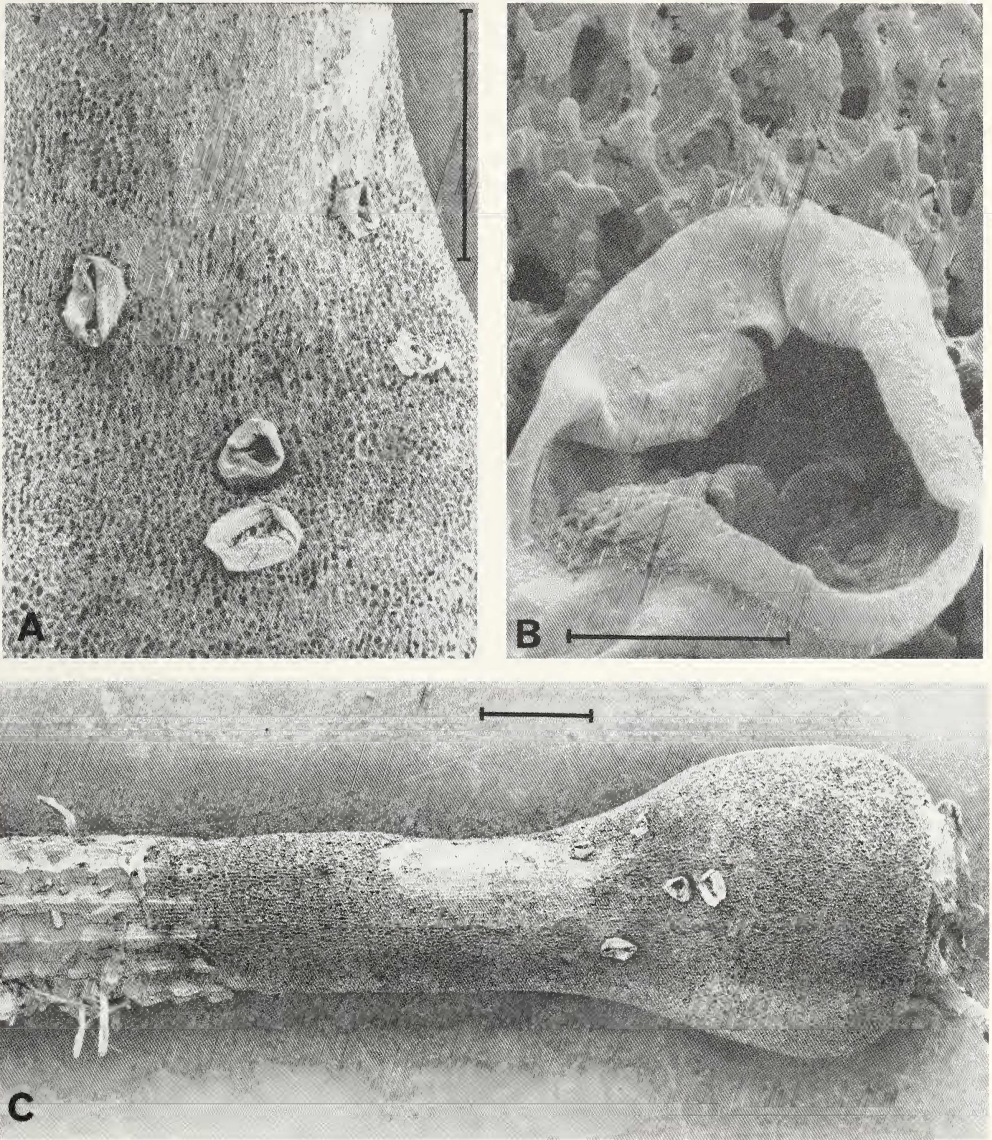


Fig. 2 *Cidaris cidaris*, of spine parasitized by *S. bonifaciae*. A. Detail of spine with five collars where snail has been attached. Scale line 1 mm. B. Close-up of collar. Scale line 0.1 mm. C. Spine with basal deformation. Scale line 1 mm.

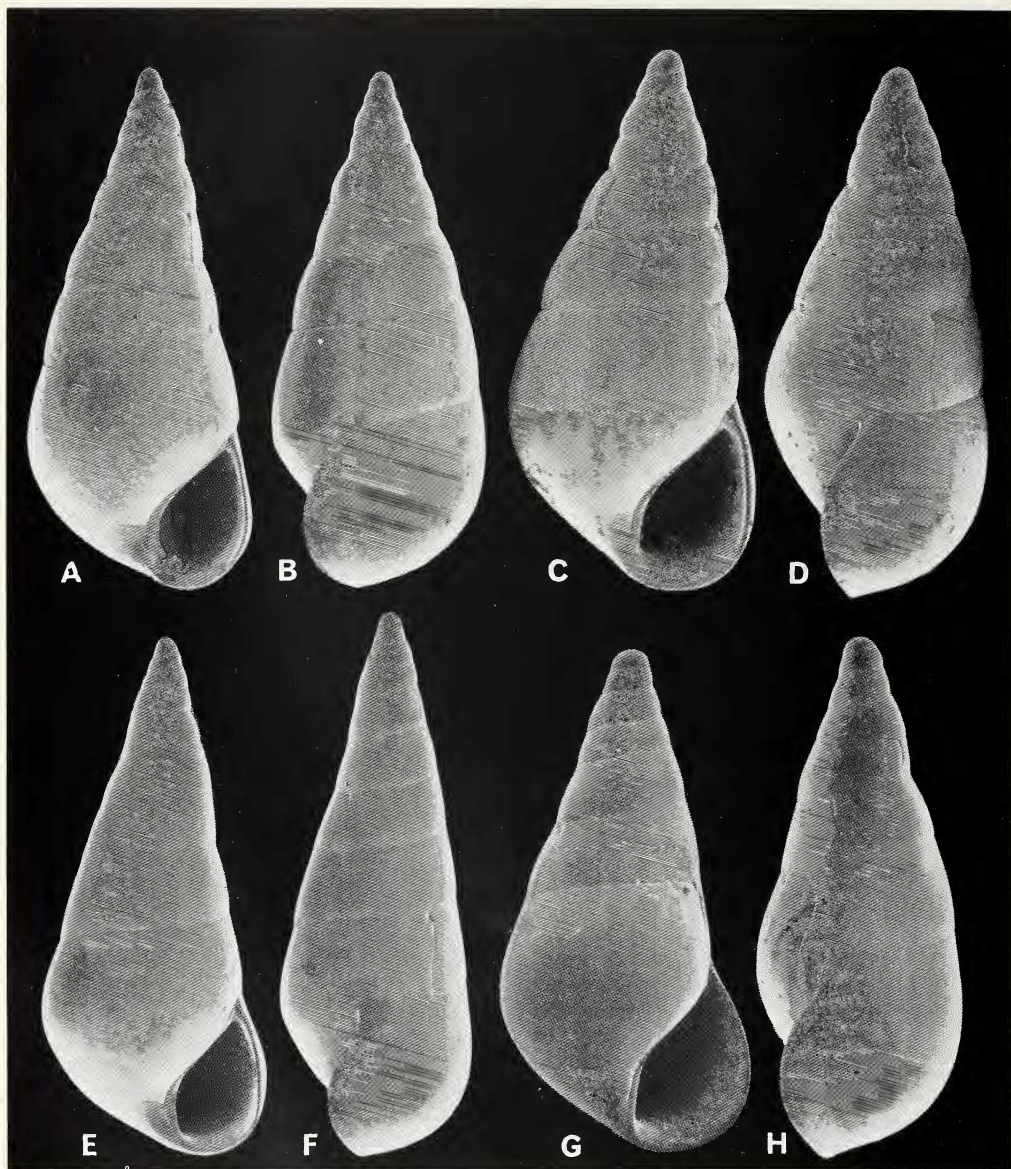


Fig. 3 *Nanobalcis* spp. A-D. *N. worsfoldi*. A. Holotype, female, 2.3 mm. B. paratype, female, 2.2. mm. C-D. Paratypes, males, 1.6 and 1.7 mm. E-H. *N. nana*, leg. CROVATO. E-F. Females, 3.1 and 3.2 mm. G-H. Males 1.6 and 1.6 mm. Please notice that the male in fig. G has been turned about 1/20 of a turn to show how the appearance of the aperture changes by this small deviation from a perfect front view.



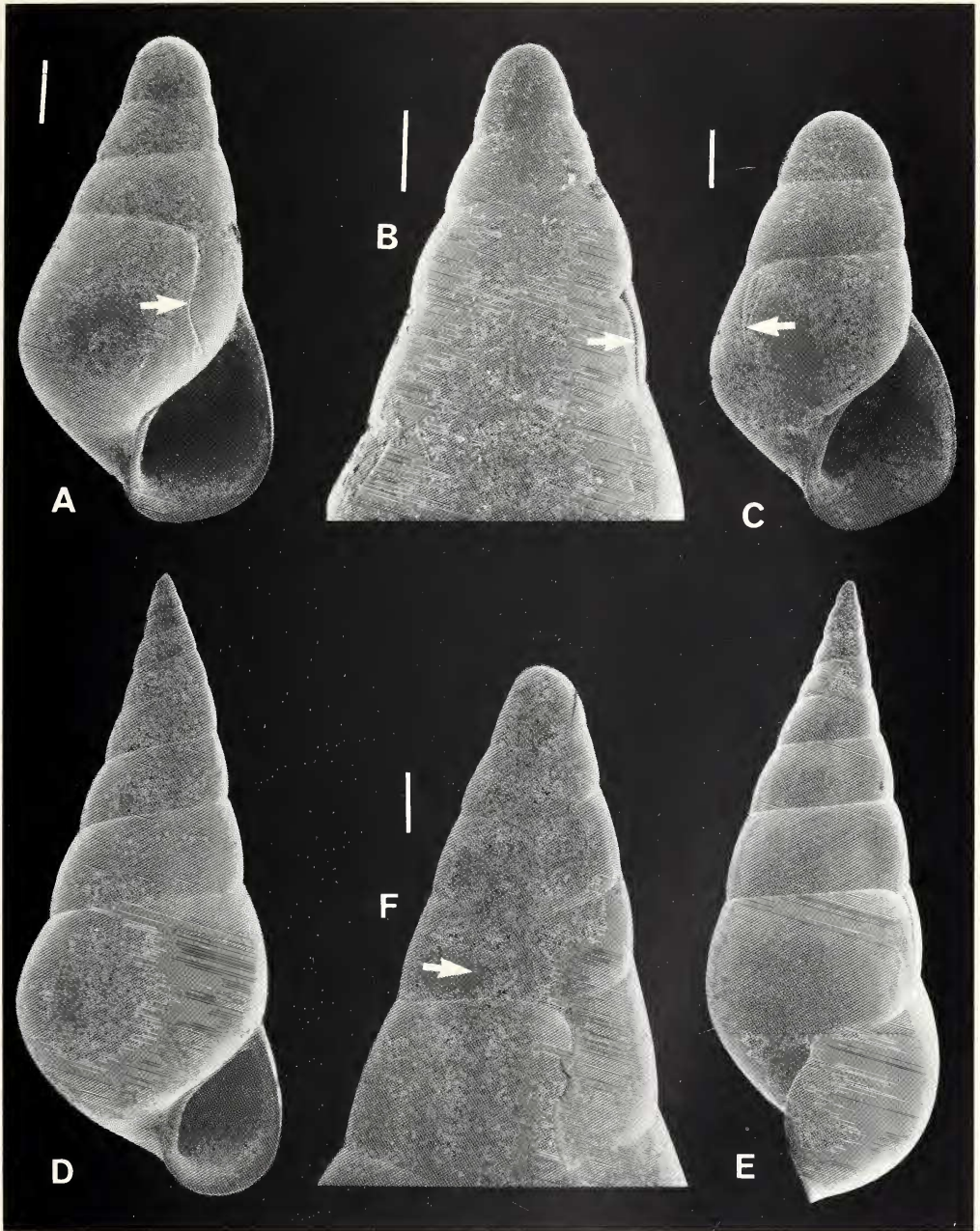


Fig. 4 Apices. A. *N. nana*, leg. MIFSUD. B. Holotype, *N. worsfoldi*. C. *S. bonifaciae*, leg MIFSUD, D-F. *N. cherbonnieri*, holotype. The white arrow indicates the border between larval shell and teleoconch. Scale lines 0.1 mm.

## Post scriptum

After this was printed MIFSUD obtained seven more specimens of *Cidaris cidaris* from Ras-il-Qammieh, Malta, parasitized by 2, 3, 1, 1, 1, 0, 0 specimens of *Sabinella bonifaciae* and 1, 2, 2, 14, 8, 0, 0 specimens of *Nanobalcis nana* respectively.

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